WHAT IS CLAIMED IS:

1. A method of receiving layered modulation signals, comprising:

receiving a layered modulation signal including an upper layer signal and a lower layer signal (602);

demodulating and decoding the upper layer signal from the received layered modulation signal (604);

estimating an upper layer amplitude factor and an upper layer phase factor from the received layered modulation signal (618);

reconstructing a substantially ideal upper layer signal from the demodulated and decoded upper layer signal including matching an ideal amplitude and an ideal phase by applying the upper layer amplitude factor and the upper layer phase factor to the reconstructed ideal upper layer signal (620);

subtracting the reconstructed ideal upper layer signal from the received layered modulation signal (622) to produce the lower layer signal for processing.

2. The method of claim 1, wherein the upper layer phase factor and the upper layer amplitude factor are combined to form a complex multiplying factor, which is the complex correlation of a received signal vector and a reconstructed signal vector and normalized by a power of the reconstructed signal vector.

3. The method of claim 2, wherein the complex multiplying factor is mathematically expressed by $z_{LS} = \left(\underline{X}^H \underline{X}\right)^{-1} \underline{X}^H \underline{R}$, where $\underline{R}$ is the received signal vector and $\underline{X}$ is the reconstructed signal vector.

4. The method of claim 1, wherein the upper layer phase factor is estimated from a mean vector of a distribution of the received layered modulation signal relative to one or more nodes of the upper layer signal.

5. The method of claim 1, wherein the upper layer amplitude factor is estimated from a mean vector of a distribution of the received layered modulation signal relative to one or more nodes of the upper layer signal.

6. An apparatus for receiving layered modulation signals, comprising:

a signal processor for demodulating (504) and decoding (508) an upper layer signal from a received layered modulation signal (502) wherein the received signal includes the upper layer signal and a lower layer signal;

an estimator (522) for estimating an upper layer amplitude factor and an upper layer phase factor from the received layered modulation signal (502);

a synthesizer (514) for reconstructing a substantially ideal upper layer signal from the demodulated and decoded upper layer signal (510) including matching an ideal amplitude and an ideal phase by applying the upper layer amplitude factor and the upper layer phase factor to the reconstructed ideal upper layer signal; and

a subtractor (524) for subtracting the reconstructed ideal upper layer signal from the received layered modulation signal to produce the lower layer signal for processing.

7. The apparatus of claim 6, wherein the upper layer phase factor and the upper layer amplitude factor are combined in a complex multiplying factor, which is the complex correlation of a received signal vector and a reconstructed signal vector and normalized by a power of the reconstructed signal vector.

8. The apparatus of claim 7, wherein the complex multiplying factor is mathematically expressed by $z_{LS} = \left(\underline{X}^H \underline{X}\right)^{-1} \underline{X}^H \underline{R}$, where $\underline{R}$ is a received signal vector and $\underline{X}$ is a reconstructed signal vector.

9. The apparatus of claim 6, wherein the upper layer phase factor is estimated from a mean vector of a distribution of the received layered modulation signal relative to one or more nodes of the upper layer signal.

10. The apparatus of claim 6, wherein the upper layer amplitude factor is estimated from a mean vector of a distribution of the received layered modulation signal relative to one or more nodes of the upper layer signal.